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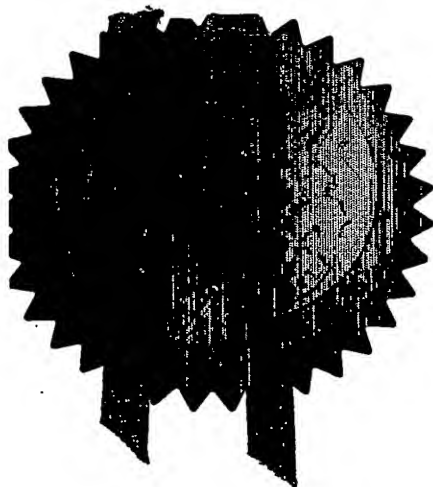
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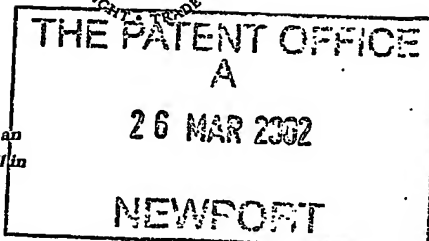
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Stephen Horchley

Dated 7 April 2003



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2 GREENSLATE MEWS
BILLINGS WIGAN
NN5 7DQ

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2 DURHAM ROAD
WIDNES
CHESHIRE
WA8 9UD

Patents ADP number (if you know it)

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3857685001

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Number of earlier application

Date of filing
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Continuation sheets of this form

Description

6 ✓

Claim(s)

2 ✓

Abstract

1 ✓

Drawing(s)

4 + 4

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Priority documents

Translations of priority documents

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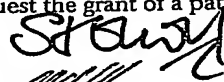
Request for substantive examination (Patents Form 10/77)

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11.

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Date 22/3/02

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IAN REILLY
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Corrugated Cardboard Pallet

This invention relates to a single trip use, corrugated cardboard pallet. It is delivered flat and is erected by simply hitting the edge of it. The pallet may be used to store or transport goods or product from a point of manufacture to a retailer. It can be four way, or two way entry, and be produced to any size. The pallet is very light weight, and can be mechanically handled. It can be free standing, stackable, or capable of being placed on racking.

Pallets are in everyday use, and are often made from wood, polythene, plastic, or metal. They may be of a general size, such as those used in the retail and retail goods manufacturing industries, or they may be made for specific applications. Their chief purpose is to safely store goods or product in quantity, and allow the goods or product to be mechanically handled within manufacturing units. The pallets also act as shipping units often via vehicle transport to the retail outlet. Again, at the retail outlet the pallets are mechanically handled and stored prior to transport to individual stores. The pallet may then also be used to display the goods or product directly on the shop floor, as a form of merchandising unit.

Pallets are normally of a high initial cost, and some systems of pallet hire are in place. Pallets may be purchased second hand, but are again costly, and may be prone to contaminants. They are bulky, and are normally of a standard height and size so that both manufacturer and retailer storage systems are compatible. Wooden pallets are also quite heavy to manhandle, and add to the crush weight of stored and transported goods or product because often several pallets of goods or product are stored on top of each other. A standard wooden pallet may weigh between 25 Kg and 50 Kg. This means manhandling is difficult, and the weight can damage the goods or product that the pallet rests upon. They are also costly to transport because of their inherent weight.

A typical operation of a re-usable pallet maybe as follows. Manufactured product such as boxed dry goods are collated and stacked onto a standard wooden pallet. A man may then place a pallet on top of this stacked pallet and proceed to collate and place more boxed

product on top of this. Depending on how many layers of product are used on each pallet, each single stack may contain several pallets. The stack is then normally enshrouded in stretch wrap to form a unit. This unit is then mechanically handled by a manual pump truck, or a mechanical fork lift truck and placed into storage. After a period of storage, the product is ordered by a retailer, and the unit is mechanically loaded onto a transport vehicle. At the retailers depot, the unit is unloaded and stored for a period. It is then loaded onto another vehicle and delivered into a retail shop, where it may be stored, or placed direct for merchandising onto the shop floor.

The problem with this system is that the manufacturer does not get his pallet back. This is very costly to the manufacturer and ultimately the consumer. After the product or goods are used from the pallet, the retailer must then dispose of the wooden pallet, which is bulky and heavy. To dispose of it requires expensive transport, and is costly to the environment, with pallets often ending up in landfill.

If the hire system is used, then a pallet must first be hired by a manufacturer. A system of tracking the pallets is needed which is labour intensive and costly. Then it is left at the retailer. The retailer may have a stock of empty pallets which he can give back to the manufacturer, and so load up a vehicle to transport bulky, heavy, and empty pallets back to the manufacturer at his cost. A manufacturer also has to pay to de-hire a pallet, and if one is lost, will have to pay full cost for it. And so the cycle begins again. Re-using pallets also leads to problems of cleanliness and repair. Wooden pallets are normally put together with nails. The nails may become exposed and damage the goods or product placed upon them. Wooden pallets may also produce large or small splinters which can either damage the product or even enter and contaminate product, especially food goods.

The standard height of most pallets, usually about 160mm, also dictate how much product can be transported on a vehicle such as a curtain sider. Wooden pallets are heavy, and may double in weight when wet, making manual handling dangerous.

The present invention overcomes many of these difficulties. It may be stored un-erected in flat form, thus giving a 600% saving on storage space over conventional pallet systems. It is transported prior to use, in flat

form meaning that fewer vehicles are needed. Once erected, the pallet is only about 100mm high, being almost half the height of a standard wooden pallet, but tall enough to enable handling by all standard mechanical means. It is designed for single trip use, therefore, whilst robust enough to be mechanically handled and transported several times, it is envisaged that the pallet is compacted and recycled after use. This saves on storage space, and costly return transport. The pallet is far less costly to make than any other type of wooden pallet currently in existence, minimising the cost to the ultimate consumer.

On average the preferred embodiment of the pallet weighs about 1Kg, and can thus be manually handled without any worry of health and safety weight constraints. Because of its lightness, it does not cause product damage when used in multi-stacked units. It is designed for two way or four way entry, and can be handled by manual pallet pump truck, and mechanical fork lift trucks of various types without modification. The basic constructional design of the invention can be used for any size of pallet required. By varying the grade of corrugated cardboard used, the invention can be made to withstand varying dead loads up to several tons.

The invention is so designed that the pallet can be placed safely in most racking systems.

The pallet is manufactured from 11 pieces of corrugated cardboard which have been stamped out. The top sheet of the pallet can be made from a plurality of walled corrugated cardboard, depending on the strength characteristics required. It is envisaged that it will normally be used with loads of less than 700Kg, but by varying the grammage of board used, and type of fluting, it can be made to withstand considerably more weight. To this top sheet, are glued 9 collapsable boxes. These box sections give the pallet its loadbearing capability. These box sections are unique double blind boxes with self erecting ends. When the sides of the boxes are pressed inwards, they form a rigid box, which cannot be made to flatten again. These elements have a degree of flexibility in them, so that vibrating movement through them will have a dampened action. To the base of these boxes, is attached by glue another sheet of corrugated cardboard, which has access slots cut in so that the whole can be mechanically handled by a pump truck. No metal staples are used, just glue. When in its un-erected flat form, the preferred embodiment is only about 25mm thick.

When the edges are struck on a surface, or pushed together, the pallet pops open into a rigid 100mm high pallet. The pallet can be machine erected, as in conventional automated palletising systems, or may be easily hand erected in one motion by striking one edge on the floor.

Because the pallet does not have any metal mechanical fastenings, it cannot damage or contaminate any product or goods placed upon it. Its height means that extra product layers may be gained for transport. Although the invention is formed from standard corrugated cardboard, it may also be treated by varnish or other suitable means to make it water resistant. The invention could also be printed with descriptors, or for decoration such as in a shop display merchandising unit.

A preferred embodiment of the invention will now be described with reference to the accompanying drawings in which :

Figure 1 shows a plan view of the top cardboard blank prior to assembly.

Figure 2 shows a plan view of the base cardboard blank prior to assembly.

Figure 3 shows a detailed plan of one double blind self erecting box blank to enable description of the folding and gluing method of assembly.

Figure 4 shows a perspective view of the erected pallet detailing access for mechanical handling.

Figure 5 shows a view of the underside of the top piece, showing the positioning of the five double blind self erecting boxes.

Figure 6 shows a perspective view of one double blind box element when it is erect.

Figure 7 shows a perspective view of one double blind box element in its flat form.

In Figure 3 solid lines denote cut lines, broken lines denote fold lines, heavy dotted lines denote reverse fold lines.

The preferred practical embodiment of the cardboard pallet, which is shown in the drawings, is made from eleven single sheets of corrugated cardboard, which are stamped out, as shown in Figures 1, 2, and 3. When formed it has a rectangular top Figure 1. This may have a plurality of fluting direction. To the underside of which are glued nine respective different sized box section rectangular side walls. The orientation of the fluting with respect to these boxes is vital to the overall compressive strength of the pallet. These are glued in positions that allow for mechanical forklift access along all four edges of the pallet. They are also spaced so that they will always be in correct position to bear on standard warehouse racking systems. There are four different sizes of box sections used in each pallet which are enumerated in Figure 5.

Figure 1 shows the shape of the corrugated cardboard top piece (28).

Figure 3 shows a plan view of one double blind self erecting box element. Referring to Figure 3, flaps (11, 22) are folded flat onto panel (18). Flaps (12, 23) are then folded back so that they lie against panels (11, 22). Glue is then applied to flaps (12, 23). Flaps (13, 24) are folded flat against panel (19). Panels (18, 19) are now folded against each other so that flaps (12, 13) and (23, 24) are glued to each other. Flaps (14, 25) are folded onto panel (20). Flaps (15, 26) are then folded back so that they lie against panels (14, 25). Glue is then applied to flaps (15, 26). Flaps (16, 27) are then folded flat against panel (21). Panels (20, 21) are now folded against each other so that flaps (15, 16) and (26, 27) are glued to each other. Glue is then applied to panel (17), which is then brought over to stick to the outside of panel (21). All this is done by multi-point machine gluers at high speed.

Figure 7 shows a glued and assembled double blind box element in its flattened form.

Figure 5 shows a plan view of the underside of the pallet top. It details the location of the nine double blind boxes, which create the pallets compressive strength. In all, there are four different sized box elements for each pallet. Referring to the drawing, the preferred embodiment has one size of box (30, 32, 36, 38) which are placed at the corners of the pallet. One size of box (34) is placed in the centre of the pallet. One size of box (31, 37) are placed at opposite front faces of the pallet. One size of box (33, 35) are placed at opposite edges of the pallet. These are attached to the top of the pallet using glue, applied to panel (18) of the boxes. This is then stuck in the appropriate position to the underside of the pallet top. In all, nine box elements, in their flattened form are glued in place per pallet.

Glue is then applied to panel (20) of the boxes. Referring to Figure 2, the pallet bottom (29) is then stuck to the flattened boxes.

This then completes the flattened pallet. All this assembly and gluing is done by machine at speed.

Referring to Figure 6, this shows the erect box element. Figure 7 shows it in flattened form. To erect the pallet, edge (B), Figure 4 is struck on the floor, or by way of machine, and the pallet pops up into its erect form, an example of which is shown in Figure 4.

Figure 4 shows a preferred embodiment of a four way entry pallet. The mechanical handling forks can be introduced at (A, B) on either edge of the pallet. If a pallet truck is used for handling, then the wheels roll over pallet base (29) and then sit against the floor as the pallet is elevated for moving. Figure 4 shows several of the box elements in erect form.

The direction of the fluting in the top (28) and the bottom (29) may be in any of a plurality of directions. The direction of fluting in the double blind box elements must always be in direction (C) as shown in Figure 3.

Claims

1. A corrugated cardboard pallet which is glued together, without the aid of any metal staples, so as to provide a flat top, side walls which are glued and folded together so as to form double blind self erecting boxes, and a glued base.
2. A corrugated cardboard pallet which is manufactured in a flattened form, and which pops up ready for use when struck on one edge.
3. A corrugated cardboard pallet as claimed in claim 1 which is made from eleven corrugated cardboard blanks.
4. A corrugated cardboard pallet as claimed in claim 1 or claim 2 wherein the grade, fluting, and plurality of walls and size of the cardboard blank dictates the type and weight of product that the pallet can carry.
5. A corrugated cardboard pallet which may weigh as little as 1 Kg.
6. A corrugated cardboard pallet as claimed in claim 1 or claim 2 or claim 3, that can carry a variety of manufactured goods or produce.
7. A corrugated cardboard pallet as claimed in any preceding claim which may be used as a storage medium on the floor, on racking, or stackable one on another.
8. A corrugated cardboard pallet as claimed in any preceding claim which when loaded can be used to transport a load.
9. A corrugated cardboard pallet as claimed in any preceding claim which can be easily man handled.
10. A corrugated cardboard pallet as claimed in any preceding claim which can be rendered water resistant by the application of a varnish.

11. A corrugated cardboard pallet as claimed in any preceding claim which is for one trip use and which is disposable.
12. A corrugated cardboard pallet as claimed in any preceding claim which is recyclable after use.
13. A corrugated cardboard pallet substantially as hereinbefore described with reference to and as illustrated by Figure 4, and Figure 5 of the accompanying drawings.
14. A collection of corrugated cardboard blanks adapted for assembly and erection to produce a pallet as claimed in any preceding claim.
15. A corrugated cardboard blank as hereinbefore described with reference to and as illustrated in Figure 1, 2, 3, 4, 5, 6, and 7 of the accompanying drawings.

ABSTRACT

Corrugated cardboard pallet

A corrugated cardboard pallet which is formed from eleven cardboard blanks. The pallet is glued together without the aid of metal fastenings of any kind. It is a two way or four way entry pallet for use with any manufactured goods or produce. It is designed for single trip use and may be disposed of after use by recycling. By varying the grade, fluting and size of cardboard blank used, the pallet may be made to suit a variety of products and weights.

Figure 4 of the accompanying drawings shows a perspective view of the pallet.

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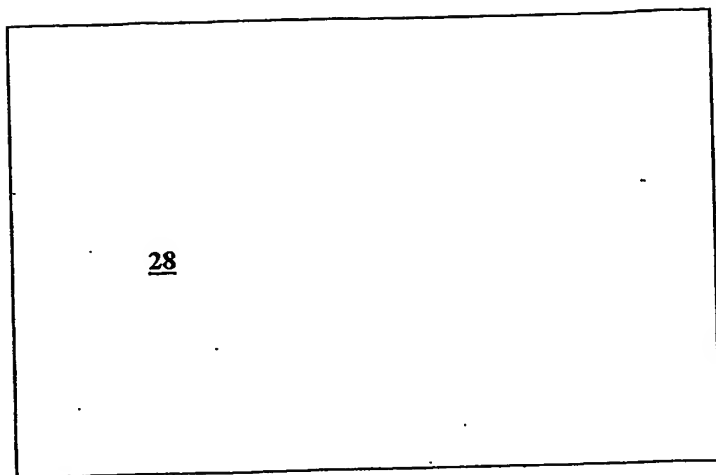


Figure 1

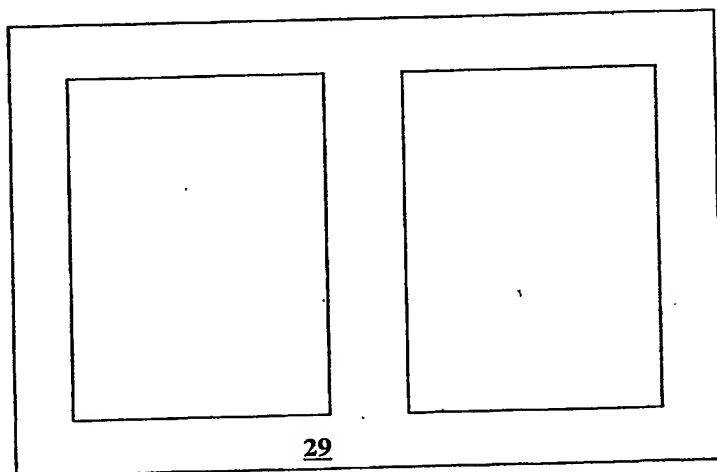


Figure 2

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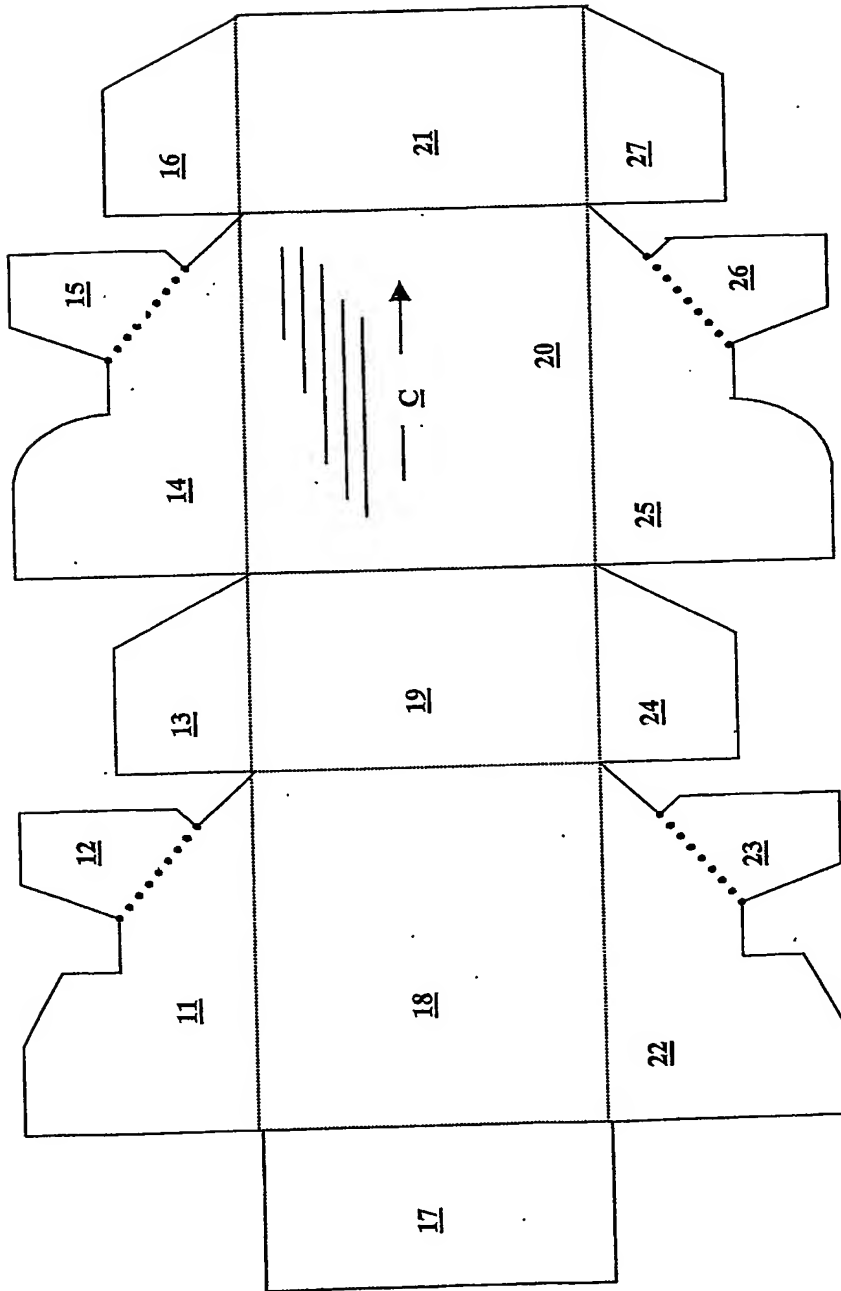


Figure 3

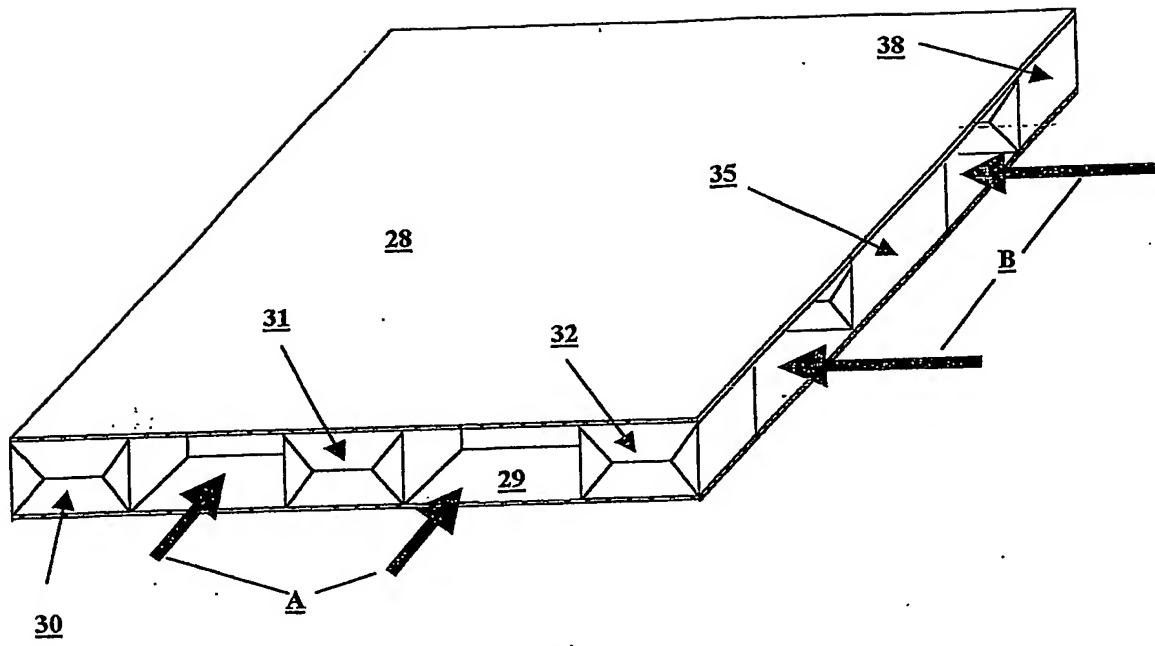


Figure 4

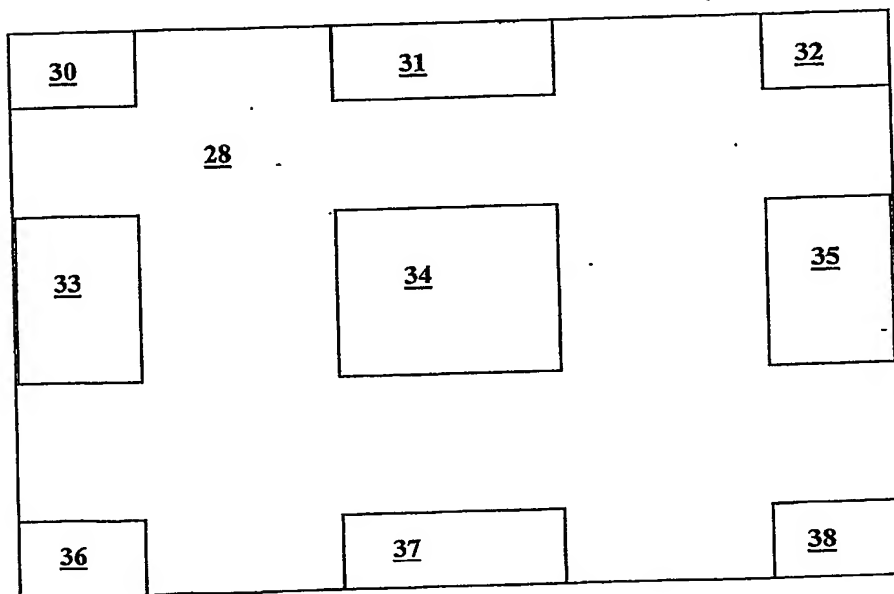


Figure 5

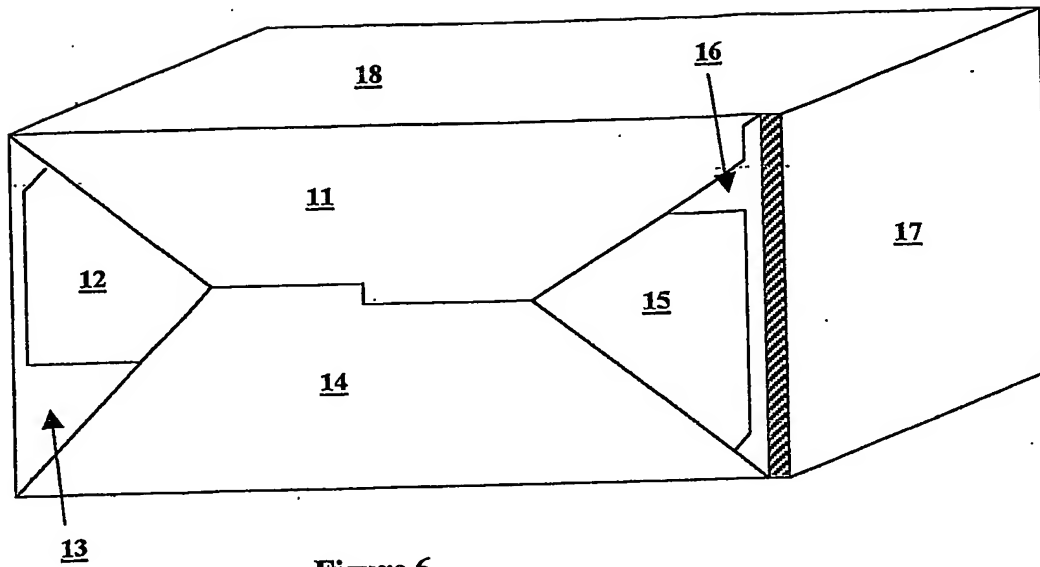


Figure 6

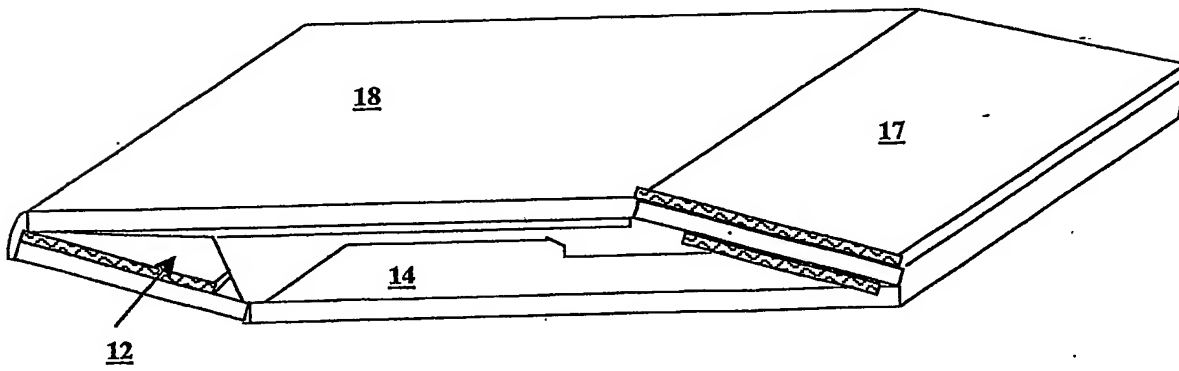


Figure 7

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